

Table of Isotopic Masses and Natural Abundances

This table lists the mass and percent natural abundance for the stable nuclides. The mass of the longest lived isotope is given for elements without a stable nuclide. Nuclides marked with an asterisk (*) in the abundance column indicate that it is not present in nature or that a meaningful natural abundance cannot be given. The isotopic mass data is from G. Audi, A. H. Wapstra *Nucl. Phys A* **1993**, 565, 1-65 and G. Audi, A. H. Wapstra *Nucl. Phys A* **1995**, 595, 409-480. The percent natural abundance data is from the 1997 report of the IUPAC Subcommittee for Isotopic Abundance Measurements by K.J.R. Rosman, P.D.P. Taylor *Pure Appl. Chem.* **1999**, 71, 1593-1607.

Z	Name	Symbol	Mass of Atom (u)	% Abundance
1	Hydrogen	¹ H	1.007825	99.9885
	Deuterium	² H	2.014102	0.115
	Tritium	³ H	3.016049	*
2	Helium	³ He	3.016029	0.000137
		⁴ He	4.002603	99.999863
3	Lithium	⁶ Li	6.015122	7.59
		⁷ Li	7.016004	92.41
4	Beryllium	⁹ Be	9.012182	100
5	Boron	¹⁰ B	10.012937	19.9
		¹¹ B	11.009305	80.1
6	Carbon	¹² C	12.000000	98.93
		¹³ C	13.003355	1.07
		¹⁴ C	14.003242	*
7	Nitrogen	¹⁴ N	14.003074	99.632
		¹⁵ N	15.000109	0.368
8	Oxygen	¹⁶ O	15.994915	99.757
		¹⁷ O	16.999132	0.038
		¹⁸ O	17.999160	0.205
9	Fluorine	¹⁹ F	18.998403	100
10	Neon	²⁰ Ne	19.992440	90.48
		²¹ Ne	20.993847	0.27
		²² Ne	21.991386	9.25
11	Sodium	²³ Na	22.989770	100
12	Magnesium	²⁴ Mg	23.985042	78.99
		²⁵ Mg	24.985837	10.00
		²⁶ Mg	25.982593	11.01
13	Aluminum	²⁷ Al	26.981538	100
14	Silicon	²⁸ Si	27.976927	92.2297
		²⁹ Si	28.976495	4.6832
		³⁰ Si	29.973770	3.0872

Z	Name	Symbol	Mass of Atom (u)	% Abundance
15	Phosphorus	³¹ P	30.973762	100
16	Sulphur	³² S	31.972071	94.93
		³³ S	32.971458	0.76
		³⁴ S	33.967867	4.29
		³⁶ S	35.967081	0.02
17	Chlorine	³⁵ Cl	34.968853	75.78
		³⁷ Cl	36.965903	24.22
18	Argon	³⁶ Ar	35.967546	0.3365
		³⁸ Ar	37.962732	0.0632
		⁴⁰ Ar	39.962383	99.6003
19	Potassium	³⁹ K	38.963707	93.2581
		⁴⁰ K	39.963999	0.0117
		⁴¹ K	40.961826	6.7302
20	Calcium	⁴⁰ Ca	39.962591	96.941
		⁴² Ca	41.958618	0.647
		⁴³ Ca	42.958767	0.135
		⁴⁴ Ca	43.955481	2.086
		⁴⁶ Ca	45.953693	0.004
		⁴⁸ Ca	47.952534	0.187
21	Scandium	⁴⁵ Sc	44.955910	100
22	Titanium	⁴⁶ Ti	45.952629	8.25
		⁴⁷ Ti	46.951764	7.44
		⁴⁸ Ti	47.947947	73.72
		⁴⁹ Ti	48.947871	5.41
		⁵⁰ Ti	49.944792	5.18
23	Vanadium	⁵⁰ V	49.947163	0.250
		⁵¹ V	50.943964	99.750
24	Chromium	⁵⁰ Cr	49.946050	4.345
		⁵² Cr	51.940512	83.789
		⁵³ Cr	52.940654	9.501
		⁵⁴ Cr	53.938885	2.365
25	Manganese	⁵⁵ Mn	54.938050	100
26	Iron	⁵⁴ Fe	53.939615	5.845
		⁵⁶ Fe	55.934942	91.754

Z	Name	Symbol	Mass of Atom (u)	% Abundance
		⁵⁷ Fe	56.935399	2.119
		⁵⁸ Fe	57.933280	0.282
27	Cobalt	⁵⁹ Co	58.933200	100
28	Nickel	⁵⁸ Ni	57.935348	68.0769
		⁶⁰ Ni	59.930791	26.2231
		⁶¹ Ni	60.931060	1.1399
		⁶² Ni	61.928349	3.6345
		⁶⁴ Ni	63.927970	0.9256
29	Copper	⁶³ Cu	62.929601	69.17
		⁶⁵ Cu	64.927794	30.83
30	Zinc	⁶⁴ Zn	63.929147	48.63
		⁶⁶ Zn	65.926037	27.90
		⁶⁷ Zn	66.927131	4.10
		⁶⁸ Zn	67.924848	18.75
		⁷⁰ Zn	69.925325	0.62
31	Gallium	⁶⁹ Ga	68.925581	60.108
		⁷¹ Ga	70.924705	39.892
32	Germanium	⁷⁰ Ge	69.924250	20.84
		⁷² Ge	71.922076	27.54
		⁷³ Ge	72.923459	7.73
		⁷⁴ Ge	73.921178	36.28
		⁷⁶ Ge	75.921403	7.61
33	Arsenic	⁷⁵ As	74.921596	100
34	Selenium	⁷⁴ Se	73.922477	0.89
		⁷⁶ Se	75.919214	9.37
		⁷⁷ Se	76.919915	7.63
		⁷⁸ Se	77.917310	23.77
		⁸⁰ Se	79.916522	49.61
		⁸² Se	81.916700	8.73
35	Bromine	⁷⁹ Br	78.918338	50.69
		⁸¹ Br	80.916291	49.31
36	Krypton	⁷⁸ Kr	77.920386	0.35
		⁸⁰ Kr	79.916378	2.28
		⁸² Kr	81.913485	11.58
		⁸³ Kr	82.914136	11.49
		⁸⁴ Kr	83.911507	57.00
		⁸⁶ Kr	85.910610	17.30
37	Rubidium	⁸⁵ Rb	84.911789	72.17
		⁸⁷ Rb	86.909183	27.83

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38	Strontium	⁸⁴ Sr	83.913425	0.56
		⁸⁶ Sr	85.909262	9.86
		⁸⁷ Sr	86.908879	7.00
		⁸⁸ Sr	87.905614	82.58
39	Yttrium	⁸⁹ Y	88.905848	100
40	Zirconium	⁹⁰ Zr	89.904704	51.45
		⁹¹ Zr	90.905645	11.22
		⁹² Zr	91.905040	17.15
		⁹⁴ Zr	93.906316	17.38
		⁹⁶ Zr	95.908276	2.80
41	Niobium	⁹³ Nb	92.906378	100
42	Molybdenum	⁹² Mo	91.906810	14.84
		⁹⁴ Mo	93.905088	9.25
		⁹⁵ Mo	94.905841	15.92
		⁹⁶ Mo	95.904679	16.68
		⁹⁷ Mo	96.906021	9.55
		⁹⁸ Mo	97.905408	24.13
		¹⁰⁰ Mo	99.907477	9.63
43	Technetium	⁹⁸ Tc	97.907216	*
44	Ruthenium	⁹⁶ Ru	95.907598	5.54
		⁹⁸ Ru	97.905287	1.87
		⁹⁹ Ru	98.905939	12.76
		¹⁰⁰ Ru	99.904220	12.60
		¹⁰¹ Ru	100.905582	17.06
		¹⁰² Ru	101.904350	31.55
		¹⁰⁴ Ru	103.905430	18.62
45	Rhodium	¹⁰³ Rh	102.905504	100
46	Palladium	¹⁰² Pd	101.905608	1.02
		¹⁰⁴ Pd	103.904035	11.14
		¹⁰⁵ Pd	104.905084	22.33
		¹⁰⁶ Pd	105.903483	27.33
		¹⁰⁸ Pd	107.903894	26.46
		¹¹⁰ Pd	109.905152	11.72
47	Silver	¹⁰⁷ Ag	106.905093	51.839
		¹⁰⁹ Ag	108.904756	48.161
48	Cadmium	¹⁰⁶ Cd	105.906458	1.25
		¹⁰⁸ Cd	107.904183	0.89
		¹¹⁰ Cd	109.903006	12.49
		¹¹¹ Cd	110.904182	12.80

Z	Name	Symbol	Mass of Atom (u)	% Abundance
		¹¹² Cd	111.902757	24.13
		¹¹³ Cd	112.904401	12.22
		¹¹⁴ Cd	113.903358	28.73
		¹¹⁶ Cd	115.904755	7.49
49	Indium	¹¹³ In	112.904061	4.29
		¹¹⁵ In	114.903878	95.71
50	Tin	¹¹² Sn	111.904821	0.97
		¹¹⁴ Sn	113.902782	0.66
		¹¹⁵ Sn	114.903346	0.34
		¹¹⁶ Sn	115.901744	14.54
		¹¹⁷ Sn	116.902954	7.68
		¹¹⁸ Sn	117.901606	24.22
		¹¹⁹ Sn	118.903309	8.59
		¹²⁰ Sn	119.902197	32.58
		¹²² Sn	121.903440	4.63
		¹²⁴ Sn	123.905275	5.79
51	Antimony	¹²¹ Sb	120.903818	57.21
		¹²³ Sb	122.904216	42.79
52	Tellurium	¹²⁰ Te	119.904020	0.09
		¹²² Te	121.903047	2.55
		¹²³ Te	122.904273	0.89
		¹²⁴ Te	123.902819	4.74
		¹²⁵ Te	124.904425	7.07
		¹²⁶ Te	125.903306	18.84
		¹²⁸ Te	127.904461	31.74
		¹³⁰ Te	129.906223	34.08
53	Iodine	¹²⁷ I	126.904468	100
54	Xenon	¹²⁴ Xe	123.905896	0.09
		¹²⁶ Xe	125.904269	0.09
		¹²⁸ Xe	127.903530	1.92
		¹²⁹ Xe	128.904779	26.44
		¹³⁰ Xe	129.903508	4.08
		¹³¹ Xe	130.905082	21.18
		¹³² Xe	131.904154	26.89
		¹³⁴ Xe	133.905395	10.44
		¹³⁶ Xe	135.907220	8.87
55	Cesium	¹³³ Cs	132.905447	100
56	Barium	¹³⁰ Ba	129.906310	0.106
		¹³² Ba	131.905056	0.101
		¹³⁴ Ba	133.904503	2.417
		¹³⁵ Ba	134.905683	6.592
		¹³⁶ Ba	135.904570	7.854

Z	Name	Symbol	Mass of Atom (u)	% Abundance
		¹³⁷ Ba	136.905821	11.232
		¹³⁸ Ba	137.905241	71.698
57	Lanthanum	¹³⁸ La	137.907107	0.090
		¹³⁹ La	138.906348	99.910
58	Cerium	¹³⁶ Ce	135.907144	0.185
		¹³⁸ Ce	137.905986	0.251
		¹⁴⁰ Ce	139.905434	88.450
		¹⁴² Ce	141.909240	11.114
59	Praseodymium	¹⁴¹ Pr	140.907648	100
60	Neodymium	¹⁴² Nd	141.907719	27.2
		¹⁴³ Nd	142.909810	12.2
		¹⁴⁴ Nd	143.910083	23.8
		¹⁴⁵ Nd	144.912569	8.3
		¹⁴⁶ Nd	145.913112	17.2
		¹⁴⁸ Nd	147.916889	5.7
		¹⁵⁰ Nd	149.920887	5.6
61	Promethium	¹⁴⁵ Pm	144.912744	*
62	Samarium	¹⁴⁴ Sm	143.911995	3.07
		¹⁴⁷ Sm	146.914893	14.99
		¹⁴⁸ Sm	147.914818	11.24
		¹⁴⁹ Sm	148.917180	13.82
		¹⁵⁰ Sm	149.917271	7.38
		¹⁵² Sm	151.919728	26.75
		¹⁵⁴ Sm	153.922205	22.75
63	Europium	¹⁵¹ Eu	150.919846	47.81
		¹⁵³ Eu	152.921226	52.19
64	Gadolinium	¹⁵² Gd	151.919788	0.20
		¹⁵⁴ Gd	153.920862	2.18
		¹⁵⁵ Gd	154.922619	14.80
		¹⁵⁶ Gd	155.922120	20.47
		¹⁵⁷ Gd	156.923957	15.65
		¹⁵⁸ Gd	157.924101	24.84
		¹⁶⁰ Gd	159.927051	21.86
65	Terbium	¹⁵⁹ Tb	158.925343	100
66	Dysprosium	¹⁵⁶ Dy	155.924278	0.06
		¹⁵⁸ Dy	157.924405	0.10
		¹⁶⁰ Dy	159.925194	2.34
		¹⁶¹ Dy	160.926930	18.91
		¹⁶² Dy	161.926795	25.51
		¹⁶³ Dy	162.928728	24.90

Z	Name	Symbol	Mass of Atom (u)	% Abundance
		¹⁶⁴ Dy	163.929171	28.18
67	Holmium	¹⁶⁵ Ho	164.930319	100
68	Erbium	¹⁶² Er	161.928775	0.14
		¹⁶⁴ Er	163.929197	1.61
		¹⁶⁶ Er	165.930290	33.61
		¹⁶⁷ Er	166.932045	22.93
		¹⁶⁸ Er	167.932368	26.78
		¹⁷⁰ Er	169.935460	14.93
69	Thulium	¹⁶⁹ Tm	168.934211	100
70	Ytterbium	¹⁶⁸ Yb	167.933894	0.13
		¹⁷⁰ Yb	169.934759	3.04
		¹⁷¹ Yb	170.936322	14.28
		¹⁷² Yb	171.936378	21.83
		¹⁷³ Yb	172.938207	16.13
		¹⁷⁴ Yb	173.938858	31.83
		¹⁷⁶ Yb	175.942568	12.76
71	Lutetium	¹⁷⁵ Lu	174.940768	97.41
		¹⁷⁶ Lu	175.942682	2.59
72	Hafnium	¹⁷⁴ Hf	173.940040	0.16
		¹⁷⁶ Hf	175.941402	5.26
		¹⁷⁷ Hf	176.943220	18.60
		¹⁷⁸ Hf	177.943698	27.28
		¹⁷⁹ Hf	178.945815	13.62
		¹⁸⁰ Hf	179.946549	35.08
73	Tantalum	¹⁸⁰ Ta	179.947466	0.012
		¹⁸¹ Ta	180.947996	99.988
74	Tungsten	¹⁸⁰ W	179.946706	0.12
		¹⁸² W	181.948206	26.50
		¹⁸³ W	182.950224	14.31
		¹⁸⁴ W	183.950933	30.64
		¹⁸⁶ W	185.954362	28.43
75	Rhenium	¹⁸⁵ Re	184.952956	37.40
		¹⁸⁷ Re	186.955751	62.60
76	Osmium	¹⁸⁴ Os	183.952491	0.02
		¹⁸⁶ Os	185.953838	1.59
		¹⁸⁷ Os	186.955748	1.96
		¹⁸⁸ Os	187.955836	13.24
		¹⁸⁹ Os	188.958145	16.15
		¹⁹⁰ Os	189.958445	26.26
		¹⁹² Os	191.961479	40.78

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77	Iridium	¹⁹¹ Ir	190.960591	37.3
		¹⁹³ Ir	192.962924	62.7
78	Platinum	¹⁹⁰ Pt	189.959930	0.014
		¹⁹² Pt	191.961035	0.782
		¹⁹⁴ Pt	193.962664	32.967
		¹⁹⁵ Pt	194.964774	33.832
		¹⁹⁶ Pt	195.964935	25.242
		¹⁹⁸ Pt	197.967876	7.163
79	Gold	¹⁹⁷ Au	196.966552	100
80	Mercury	¹⁹⁶ Hg	195.965815	0.15
		¹⁹⁸ Hg	197.966752	9.97
		¹⁹⁹ Hg	198.968262	16.87
		²⁰⁰ Hg	199.968309	23.10
		²⁰¹ Hg	200.970285	13.18
		²⁰² Hg	201.970626	29.86
		²⁰⁴ Hg	203.973476	6.87
81	Thallium	²⁰³ Tl	202.972329	29.524
		²⁰⁵ Tl	204.974412	70.476
82	Lead	²⁰⁴ Pb	203.973029	1.4
		²⁰⁶ Pb	205.974449	24.1
		²⁰⁷ Pb	206.975881	22.1
		²⁰⁸ Pb	207.976636	52.4
83	Bismuth	²⁰⁹ Bi	208.980383	100
84	Polonium	²⁰⁹ Po	208.982416	*
85	Astatine	²¹⁰ At	209.987131	*
86	Radon	²²² Rn	222.017570	*
87	Francium	²²³ Fr	223.019731	*
88	Radium	²²⁶ Ra	226.025403	*
89	Actinium	²²⁷ Ac	227.027747	*
90	Thorium	²³² Th	232.038050	100
91	Protactinium	²³¹ Pa	231.035879	100
92	Uranium	²³⁴ U	234.040946	0.0055
		²³⁵ U	235.043923	0.7200
		²³⁸ U	238.050783	99.2745

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93	Neptunium	²³⁷ Np	237.048167	*
94	Plutonium	²⁴⁴ Pu	244.064198	*
95	Americium	²⁴³ Am	243.061373	*
96	Curium	²⁴⁷ Cm	247.070347	*
97	Berkelium	²⁴⁷ Bk	247.070299	*
98	Californium	²⁵¹ Cf	251.079580	*
99	Einsteinium	²⁵² Es	252.082972	*
100	Fermium	²⁵⁷ Fm	257.095099	*
101	Mendelevium	²⁵⁸ Md	258.098425	*
102	Nobelium	²⁵⁹ No	259.101024	*
103	Lawrencium	²⁶² Lr	262.109692	*
104	Rutherfordium	²⁶³ Rf	263.118313	*
105	Dubnium	²⁶² Db	262.011437	*
106	Seaborgium	²⁶⁶ Sg	266.012238	*
107	Bohrium	²⁶⁴ Bh	264.012496	*
108	Hassium	²⁶⁹ Hs	269.001341	*
109	Meitnerium	²⁶⁸ Mt	268.001388	*
110	Ununnilium	²⁷² Uun	272.001463	*
111	Unununium	²⁷² Uuu	272.001535	*
112	Ununbium	²⁷⁷ Uub	(277)	*
114	Ununquadium	²⁸⁹ Uuq	(289)	*
116	Ununhexium	²⁸⁹ Uuh	(289)	*
118	Ununoctium	²⁹³ Uuo	(293)	*